GIS Mapping

GIS Mapping
Introduction to GIS Mapping
Introduction to Development Suitability Maps Base Maps

76

77

Introduction to GIS Mapping

Geographic Information Systems (GIS) are quickly becoming a staple of our times. Defined broadly, GIS is a computer-based system "for capture, retrieval, analysis, and display of spatial (locationally defined) data." The essential elements in this definition for local governments are "spatial" and "analysis": where are things, why do we want to know about them, and how can our community use this information to make better decisions?

GIS is a system of computer software, hardware, data, and personnel to help manipulate, analyze and present information that is tied to a specific location on the earth. Aspects of GIS include:

spatial location – usually a geographic location information – visualization of analysis of data
 system – linking software, hardware, data
 personnel – the key to the power of GIS

GIS applies modern computer graphics and database technology to the efficient, cost-effective management and planning of the local government's assets. It provides enhanced capabilities for data storage, retrieval, and analysis. GIS does this by linking (1) maps and (2) databases. This marriage lets us easily explore the relationship between (1) location and (2) information.

The real key for small city governments is that GIS quickly integrates *information* with location. Through its use of computer technology, GIS provides a better, faster, easier way for local officials to find answers to questions and carry out analyses based on spatial relationships.

Berkshire Regional Planning Commission uses GIS in projects covering almost all aspects of planning. This includes environmental, land use, community development, transportation, economic and housing projects. BRPC uses our GIS for map creation, data development and spatial analysis.

Throughout the Community Development Plan, GIS has been used to create a series of base maps illustrating what is in each community and has allowed community officials to determine where the most suitable locations are for various types of development / preservation. Some communities also used suitability maps to assist them in determine where the best locations for development / preservation were. These suitability maps were created by evaluating the importance of various environmental, housing, economic, and transportation items and plotting the best and worst locations based on the combination of all these factors. The final maps presented throughout the report show the decisions that were arrived at by the community. In this section, the base maps are presented as reference to show what is currently in the town. The descriptions of the mapped items that you will find within these base maps are listed below.

Introduction to Development Suitability Maps

Description of Map Attributes

Environmental Resources

Drinking Water

Aquifers – shows medium and high yield aquifers as delineated by USGS Water Resource Division. The original data is from the USGS 1:48,000 hydrologic atlas series on groundwater favorability.

Interim Wellhead Protection areas – shows the primary, protected area for PWS groundwater sources in the absence of an approved Zone II. The radius around the well is determined by the pumping rate in GPM of the well. Wellhead protection areas are important for protecting the recharge area around public water supply (PWS) wells.

Lakes/Ponds Resource Area – shows a 100 ft. buffer around the lakes and ponds that are on the USGS topographical maps. This buffer shows the area that has an immediate impact of the lakes and ponds.

Outstanding Resource Water – shows waters which constitute an outstanding resource as determined by their outstanding socioeconomic, recreational, ecological, and / or aesthetic values and which shall be protected and maintained as determined under Massachusetts Surface Water Quality Standards of 1995

Wellhead Protection Zone I – shows a 400 ft. buffer around public water supply points.

Wellhead Protection Area Zone II – shows the primary, protected area for PWS groundwater sources based upon the area of an aquifer which contributes to a well under the most severe pumping and recharge conditions that can realistically be anticipated. Wellhead protection areas are important for protecting the recharge area around public water supply (PWS) wells.

Water Bodies and Protection Areas

FEMA 100yr. Floodplain – shows areas of possible risk associated with flooding. This layer was created by the Federal Emergency Management Agency (FEMA) from the Flood Insurance Rate Maps (FIRM)

Lakes / Ponds Resource Areas - 100 ft - shows a 100-foot buffer around lakes and ponds that defines the resource area that contributes to the lake/pond. The lakes and ponds are derived from USGS topo maps.

River Protection Area -200 ft. - Shows a 200-foot buffer delineating the resource area of perennial streams. These areas were created as an addition to the long-standing Wetlands Protection Act. The law establishes protected riverfront areas that extend 200 feet from the mean annual high-water line.

Surface Water Protection Area Zone A – shows land between the surface water source and the upper boundary of the bank, the land within a 400 foot lateral distance from the upper boundary of the bank of a Class A surface water source and the land within a 200 foot lateral distance from the upper boundary of the bank of a tributary or associated surface water body. These areas are included in the Massachusetts Drinking Water Regulations as Surface Water Supply Protection Zones.

Surface Water Protection Area Zone B – shows the land within one-half mile of the upper boundary of the bank of a Class A surface water source or the edge of the watershed, whichever is less. Zone B always included the land area within a 400 ft lateral distance from the upper boundary of the bank of the Class A surface water source. These areas are included in the Massachusetts Drinking Water Regulations as Surface Water Supply Protection Zones.

Wetland Resource Areas – shows a 100-foot buffer around wetlands that defines the resource area that contributes to the wetland. The wetlands are derived from USGS topographical maps.

Wetlands – shows wetlands derived from USGS topographical maps.

Soils / Geology

Excessively Drained Soils— shows soils that have too much or too rapid loss of water, either by percolation or by surface flow. The occurrence of internal free water is very rare or very deep. This layer was derived from the US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database.

Highly Erodible Soils – shows soils that are highly susceptible to erosion from wind and/or water. This layer was derived from the US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database.

Hydric Soils – Soils that are wet long enough to periodically produce anaerobic conditions, thereby influencing the growth of plants. This layer was derived from the US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database.

Poorly Drained soils— shows soils that do not lose water very rapidly. The occurrence of free water is common. This layer was derived from the US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database.

Scenic Landscapes – shows areas identified as having distinctive or noteworthy scenic landscapes as part of the Massachusetts Landscape Inventory Project, Department of Environmental Management, 1981.

Slopes Greater then 15% - shows slopes that are greater then 15% based on slope information derived from either 3 or 10-meter contours generated by MassGIS

Biological

Areas of Critical Environmental Concern – shows the location of areas that have been designated ACECs by the Secretary of Environmental Affairs. This designation requires greater environmental review of certain kinds of proposed development under state agency jurisdiction with the boundary.

Contiguous Natural Lands – shows large, contiguous tracts of natural land. "Contiguous" lands are defined to be at least 250 contiguous acres and "Natural" lands are defined based on the land use codes for water, forest, shrubland, pasture and wetland. The data is part of the Massachusetts Resource Identification Project (MRIP).

Natural Land Riparian Corridors – shows contiguous natural lands within a 100-meter corridor encompassing perennial streams and river features. These areas within the riparian corridor remain in a "natural state", potentially functioning as a corridor for select species movement, as well as additional ecological purposes. These data is part of the Massachusetts Resource Identification Project (MRIP).

NHESP BioMap Core Habitat - Depicts the most viable habitat for rare species and natural communities. The polygons may consist of many individual species or natural communities.

NHESP BioMap Supporting Natural Landscapes – buffers and connects the Core Habitat polygons and identifies large, naturally vegetated blocks that are relatively free from the impact of roads and other development. The quality of undeveloped land considered in the landscape analysis was evaluated based on four major components: natural vegetation patch characteristics, size of relatively road less areas, sub watershed integrity, and contribution to buffering Bore Habitat for plants and exemplary communities.

NHESP Estimated Habitats of Rare Wildlife – shows estimations of the habitats of state-protected rare wildlife populations that occur in Resource areas. These habitats are based on rare species records maintained in the Natural Heritage & Endangered Species Program's (NHESP) database.

NHESP Priority Habitats of Rare Species – shows areas that represent estimations of important state-listed rare species habitats in Massachusetts. These habitats are based in rare species population records maintained in the Natural Heritage & Endangered Species Program's (NHESP) database.

Riparian Corridors – shows a 100-meter corridor, which encompasses perennial streams and river features. The 100 meter buffer distance is a subjective value derived from existing conservation plans, as well as current literature. The data is part of the Massachusetts Resource Identification Project (MRIP).

Vernal Pools – shows a 100-foot buffer around NHESP Certified Vernal Pools. Certified Vernal Pools are protected if they fall under the jurisdiction of the Massachusetts Wetlands Protection Act Regulations. They also are afforded protection under the state Water Quality Certification regulations, the state Title 5 regulations, and the Forest Cutting Practices Act regulations.

Community

Developed

Commercial Land – shows land that is classified as commercial in the most recent land use update.

Gravel Pits / Mining - shows land that is classified as Gravel / Mining in the most recent land use update.

Industrial Land – shows land that is classified as industrial in the most recent land use update. Industrial land is defined as Industrial, Mining, and Waste Disposal.

Multi-Family Residential - shows land that is classified as Multi-Family residential in the most recent land use update.

Residential Land – shows land that is classified as residential in the most recent land use update. Residential land is defined as lots smaller then ¼ acre lots, ¼ to ½ acre lots, lots larger then ½ acre, and multi-family lots.

State Registered Historic Resources – shows land that is listed with the State Register of Historic Places as being of historical interest.

Village / Commercial Centers - an area defined by the community as representing the village or community center.

Non-Developed Land

Agriculture Land – shows land classified as agriculture in the most recent land use update. Land that is defined as agriculture is composed of cropland, pasture, and woody perennial.

Agricultural Preservation Restriction Land – shows land that is permanently protected as agricultural land due to an APR designation

Buildable Land – shows land that was determined to be buildable based upon existing development, protection, and restricted land during the 1999/2000 Buildout Analysis

Forested Land – shows land that is classified as forest in the most recent land use update.

Non-Protected Open Space – shows land that is classified as open space, but is not permanently protected.

Partial Constraints – shows land that is buildable but is limited based on land characteristics, such as slope, wetlands, and proximity to water.

Protected Open Space – shows land that is classified as open space and is permanently protected.

Recreational Resources – shows land that is classified as recreational in the most recent land use update. Recreational land is defined as Participation Recreation, Spectator Recreation and Water based Recreation.

Housing and Population Densities

Owner Housing Density – The percentage of housing that is owned by the resident on a per acre basis. The values are derived from the Census 2000 data.

Population Density - The population of the census block on a per acre basis. The values are derived from the Census 2000 data.

Rental Housing Density - The percentage of housing that is rented by the resident on a per acre basis. The values are derived from the Census 2000 data.

Seasonal Housing Density - The percentage of housing that is seasonal on a per acre basis. The values are derived from the Census 2000 data.

Infrastructure

Roads

Dirt / Unpaved Roads - roads that are considered dirt or unpaved based on the latest MassHighway inventory.

Local Roads - roads that are considered local roads based on the latest MassHighway inventory.

Minor Roads – roads that are considered collectors based on the latest MassHighway inventory.

Major Roads / Highway Access – roads that are considered arterials or interstate on the latest MassHighway inventory.

Other Transportation

Para Transit – This data layer is only useful for regional analysis. A town that is a member of BRTA receives para transit

Transit access –Roads that have existing BRTA bus service.

Rail Access – Existing rail lines that are currently used.

Air Access – The area surrounding the airports that are considered part of the airport complex.

Bike Trails -The Ashuwillticook bike trail from Lanesborough/Pittsfield line to downtown Adams.

Utilities

Public Water – a line approximating the location of the public water lines. This data was verified by DPW staff during summer of 2001.

Sewer – a line approximating the location of the sewer lines. This data was verified by DPW staff during summer of 2001.

Solid Waste Facilities - Compiled by DEP to track the locations of landfills, transfer stations, and combustion facilities.

Bureau of Waste Prevention

Major Facilities – facilities that are regulated by the DEP. These are considered to have the greatest environmental significance. Facilities included are:

- Large Quantity Generators of Hazardous Waste
- Large Quantity Toxic Users
- Hazardous Waste Recyclers
- Hazardous Waste Treatment, Storage and / or Disposal Facilities
- Facilities with Air Operating Permits
- Facilities with Groundwater Discharge Permits



































